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- (73) Patent holder: Beutel, Peter, 7741 Vohrenbach, DE
- (74) Attorney: Westphal, K., Dipl.-Ing.; Mussnug, B., Dipl.-Phys., Dr. rer. nat., 7730 Villingen-Schwenningen; Buchner, O., Dr. rer. nat., Pat. attys., 8000 Munich
- (72) Inventor: Beutel, Peter; Heuschel, Rolf, Dipl.-Ing. (FH), 7741 Vohrenbach, DE
- (?) Publications taken into consideration for judging the patent worthiness:
 - DE-OS 36 29 808 A1
 - EP 02 56 621 A1

(?) Arrangement for recording of training data for mechanical training devices

An arrangement and a method for monitoring the training on mechanical training devices are described, which can be used universally for any given training devices. A monitor unit with a microprocessor is arranged on the training device. By means of a nonvolatile portable data medium, individual training data are entered into the monitor unit. Device data are registered by the microprocessor via a sensor, which scans a mechanical motion process of the training device. The data determined by the microprocessor from the entered training data and the registered device data are displayed and put out on the data medium.

any desired mechanical training devices. It can be used likewise for the first outfitting or for the retrofitting of these training devices. All that is necessary is to mount the monitor unit on the training device and arrange the sensor connected to this monitor unit on the training device in such a way that a mechanical movement process taking place during the use of the training device can be tracked.

This mechanical movement process can be any translatory and/or rotary movement of parts of the training device, such as occurs during the use of the training device, e.g., by the lifting of weights or the stretching of springs. Preferably, the sensor is a noncontact sensor, e.g., a magnetic proximity sensor, so that the installation of the invented arrangement requires no intervention into or changing of the mechanical training device.

The memory is a nonvolatile portable data medium. This can be connected via an interface to the monitor units installed on the particular training devices. Preferably, the data medium is a semiconductor storage with the smallest possible dimensions. In particular, a data medium in the so-called check card format is advisable.

For example, the training plans for the individual persons are drawn up individually according to technical criteria in a central personal computer. These training plans can extend over a lengthy time and entail exercises on different training devices. The training parameters corresponding to the training plan are transferred to the data medium, which is issued to the user. The user can now perform his training program without additional help from trained personnel. For this, he has only to connect his data medium via the interface provided to the microprocessor of the monitor unit of the particular training device. The data records of the training parameters, coordinated with the particular training device, are kept in the data medium under a particular assigned code and these are read into the monitor unit. The monitor unit shows the user via a preferably optical monitor display the exercises being performed. The training units performed by the user are detected via the sensor. Depending on the programming of the microprocessor, the training parameters taken from the data medium and the training units recorded via the sensor are processed and prepared for output to the monitor display and to the data medium.

Thus, the user can adapt with great freedom the time course of the exercises to be performed and the sequence of training devices to be used to his personal needs. On his data medium, he always has access to the entire training plan and information on his particular place within this training plan. These data can be evaluated at any time in a more powerful computer system, e.g., the central personal computer, in order to check up on the current training status and adapt the training plan to this current status, if necessary.

Thanks to the freedom of the individual users in the determination of the time sequence for performance of the exercises and in the choice of the sequence of training devices, the training devices available at a fitness center or training camp can be utilized independently of the available personnel and, thus, much more effectively. Furthermore, it is possible to control the access authorization to the training devices through the data medium. Moreover, a training plan devised by technicians can also be carried out at home, for example, on one's own training devices, with competent monitoring through the data medium. This can be of special importance to a physician managed rehabilitation training.

The invention shall now be explained by means of a sample embodiment shown in the drawing. This shows:

Fig. 1, a schematic cross section of the mechanical training device with an arrangement for recording the training data, and

Fig. 2, this arrangement in detail.

Any given mechanical training device has a device frame 1, in which a set of weight plates 2 is guided vertically on guide rods 3. Depending on the type of training device and the parts of the body to be trained by this device, the weight plates 2 must be lifted via systems of levers and handles of varying configuration.

On the device frame 1, a monitor unit 5 is secured by means of a holder 7. The monitor unit 5 contains a microprocessor. A portable data medium 6 in the form of a semiconductor storage can be inserted in a slot 11 of the monitor unit 5 that has an interface, in order to enable data exchange between the data medium 6 and the microprocessor.

* A sensor 8 fashioned as a magnetic proximity sensor is fastened on the device frame 1 and registers the lift movements of the weight plates 2 by means of a permanent magnet 4 attached to the weight plates 2. The sensor 8 is joined by a cable 9 to the monitor unit 5, so that the microprocessor receives the signals of the sensor 8.

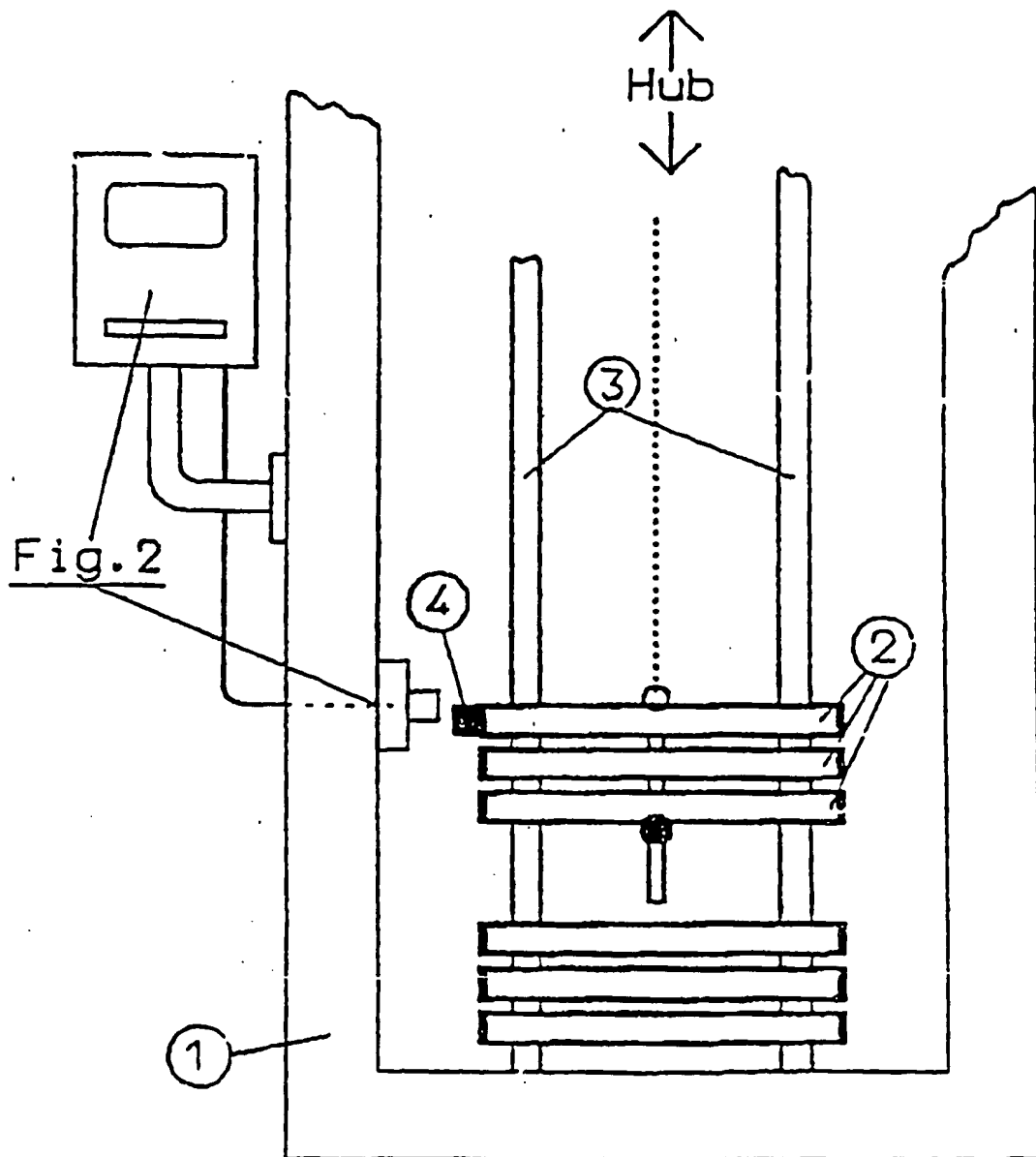
The monitor unit 5 has an optical monitor display 10, e.g., in the form of a LCD display, by which the data prepared in the microprocessor are made visible to the user.

The monitor unit 5 is energized from a rechargeable battery, so that the monitoring arrangement requires no troublesome power cord during operation.

Patent claims

1. Arrangement for recording of training data for mechanical training devices, with a monitor unit arranged on the training device and with a processor of the monitor unit, into which are fed training parameters from a memory and training units from a sensor tracking a mechanical movement process of the training device, and which is coordinated with a monitor display, characterized in that the memory is designed as a nonvolatile portable data medium (6), which can be programmed with individualized training parameters and which can be connected to the monitor units (5) of various training devices via an interface in order to enter the training parameters into the particular monitor unit (5), and the training units performed, registered via the sensor (8) of the monitor unit (9), are transferred to the data medium (6) and shown on the monitor unit (5).
2. Arrangement per claim 1, characterized in that the sensor (8) is a noncontact sensor.
3. Arrangement per claim 1, characterized in that the data medium (6) is a semiconductor memory.
4. Arrangement per claim 1, characterized in that the data medium (6) is provided for a data entry and output through a personal computer.
5. Arrangement per claim 1, characterized in that the monitor unit (5) has a battery for power supply.
6. Arrangement per claim 1, characterized in that the monitor unit (5) has an optical monitor display (10).

[Plus 2 pages of drawings]

Figur 1:

Figur 2:

